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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/521,210	03/08/2000	Hiroshi Tanaka	862.C1856	1390

5514 7590 08/29/2003

FITZPATRICK CELLA HARPER & SCINTO  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112

EXAMINER
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CHAWAN, SHEELA C

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 08/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/521,210

Applicant(s)

TANAKA, HIROSHI

Examiner

Sheela C Chawan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 37-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. Applicant's arguments filed on June 18, 2003 ( paper # 5/A ) have been fully considered and claims 1-36 have been canceled . New claims 37- 60 have been added .

Applicant's arguments filed on June 18, 2003 ( paper # 5/A ) have been fully considered but are deemed to be moot in view of the new grounds of rejection.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 37-60, are rejected under 35 U.S.C. 103(a) as being unpatentable over Cognex Corporation User's Manual ( Cognex 4000/5000 SMD Placement Guidance Package ; Fuducial finder 5 ) in view of Rostami et al. (US.5,825,913) .

Regarding claims 37 and 49, Cognex Corporation User's Manual discloses a position detection apparatus for detecting a position of a mark on an object, said apparatus comprising:

an extraction section which extracts a plurality of edge positions of the mark based on a signal derived from the image of the mark ( page 210 ), each of the edge

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positions being associated with a combination of a direction and a polarity of the signal ( page 207, page 213 normalized correlation ) ;

a determination section which determines a position of the mark ( page 182, page 184, Training a model ) by comparing each of the plurality of extracted edge positions which corresponding one of templates prepared for the respective combinations ( Pages 191, 200- 203, 208, 210 ). Cognex Corporation User's Manual is silent about specific details of a camera which captures an image of the mark. However, Rostami discloses system for finding the orientation of a wafer comprises of:

a camera which captures an image of the mark ( abstract, fig 1, item 10 CCD camera acquiring image of wafer having a notch which is considered to be a mark , column 3, lines 14- 27), use of camera which captures an image of a mark because to accurately find the orientation of the wafer using fiducial marks on the surface of the wafer regardless of where the fiducial mark is on the surface of the wafer ( column 2, lines 30- 37 ) .

Therefore , it would have been obvious to one with ordinary skill in the art at the time of invention to incorporate the teaching of a system in which camera captures an image of the mark as taught by Rostami 's into the system of Cognex Corporation User's Manual because one with ordinary skill in the art would realize that it is possible to accurately find the orientation of the wafer using fiducial marks on the surface of the wafer regardless of where the fiducial mark is on the surface of the wafer, as suggested by Rostami at ( column 2, lines 30- 37 ).

As per claims 38 and 50 , Cognex Corporation User's Manual discloses an apparatus further comprising a control section which changes a parameter used by said extraction section and said determination section based on a result of the comparing by said determination section ( pages 215 - 220, evaluating features based on specified parameters ) .

As per claims 39 and 51, Cognex Corporation User's Manual discloses an apparatus wherein the parameter changed by said control section is stored in a memory and used as a base for processing to be executed later ( pages 215 - 220, evaluating features based on specified parameters , page 222 talks about program creating /training a rectangle fiducial model ) .

As per claims 40 and 52, Cognex Corporation User's Manual discloses an apparatus wherein said determination section performs the comparing by evaluating a degree of matching between the plurality of edge positions and the templates ( page 202, pages 215 - 220, evaluating features based on specified parameters , page 222 talks about program creating /training a rectangle fiducial model ) .

As per claims 41 and 53, Cognex Corporation User's Manual discloses an apparatus wherein said determination section determines the position of the mark as a center position ( page 185 , specifying the expected size of a fiducial ) of the template based on the degree of matching ( Pages 191, 200- 203, 208, 210 ) .

As per claims 42 and 54, Cognex Corporation User's Manual discloses an apparatus wherein said determination section performs the comparing using a correlation method ( page 212 ) .

As per claims 43 and 55 , Cognex Corporation User's Manual discloses an apparatus wherein said extraction section obtains the signal by differentiating a signal of the image ( page 207, page 213 normalized correlation ) .

As per claims 44 and 56, Cognex Corporation User's Manual discloses an apparatus according to claim 43, wherein the polarity is a sign of the differential signal ( page 207, page 213 normalized correlation ) .

As per claims 45 and 57, Cognex Corporation User's Manual discloses an apparatus wherein said extraction section obtains the signal along each of at least two directions in the image ( fig 87 and 88 page 207, page 213 normalized correlation ) .

As per claims 46 and 58, Cognex Corporation User's Manual discloses an apparatus wherein the template for each of the combinations includes a plurality of positions of interest, Pages 191, 200- 203, 208, 210 ).

As per claims 47 and 59, Cognex Corporation User's Manual discloses an apparatus wherein a parameter used for at least one of a noise removal processing for the image and a correction of the edge position is changed based on the result of the comparing by said determination section ( page 191, page 213 normalized correlation ) .

As per claims 48 and 60, Rostami discloses an apparatus wherein said camera captures the image under a dark field illumination ( column 3, lines 28- 35).

***Other prior art cited***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Michael et al. (US.6,421,458 ) discloses automated inspection of objects undergoing general affine transformation .

Bedrosian et al. (US. 5,602,937) discloses methods and apparatus for machine vision high accuracy searching .

Chiu et al. (US.5,696,838) discloses pattern searching method using neural networks and correlation .

Kawada (US. 5, 754,677) discloses image processing apparatus.

Imme (US.5,073, 958) discloses method of detecting edges in images.


**Contact Information**

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is 703-305- 4876. The examiner can normally be reached on Monday through Thursday 7.30 a.m. to 6.00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (703) 308 - 5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9700.

SCC  
Sheela Chawan  
Patent Examiner  
Group Art Unit 2625  
August 21, 2003

  
Jayanti K. Patel  
Primary Examiner